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Exploring higher education and industry's initiatives to close the skill gaps

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As societies and economies become increasingly science and technology-based, powered and driven, and more global, this has resulted in the demand for a worker with different set of skills and created skill gaps. Skill gaps are disparities between the skills employers need and the skills that workers have. Current research shows a widening gap between the workers' skills and technical demands of the modern manufacturing workplace. It is important to understand the nature of these skill gaps and what causes them in order to develop sound employment, education, and training policies and practices. This paper reviews aspects of skill gaps, establishes the nature and extent of skill deficiencies among university graduates, and identifies initiatives by universities and industries to address the skill gaps problems. Fighting the skill gaps problem in our workforce is not easy, requires multi-pronged approaches, and cannot be left to education alone. A number of initiatives by universities and industries or in partnership are in place to address the skill gaps

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Introduction

Technological developments over the years have necessitated changes from the artisan-craftsman stage emphasizing manual skills to the factory system which is operated and controlled by man (Lynch, 2000; McClurkin, 1996). In addition, societies and economies have become increasingly science and technology-based, powered and driven, and more global (Horn, 2005; UNESCO, 2005), resulting in the demand for a worker with different set of skills, often multi-skilled, and capable of learning new skills more rapidly (Brand, 1992). Also, over the last few years, the downsizing and merging of companies has created skill gaps due to changing work processes and operating with reduced workforce (Abraham, 2000). All these developments impact worker skills, since the workers have to operate under different environments. As a result, issues of skill gaps have constantly taken center stage.

Skill gaps are disparities between the skills employers need and the skills that workers have (Sacramento Observer, 2002). Current research shows a widening gap between the workers' skills and technical demands of the modern manufacturing workplace (Hopkins, 2005). This is not surprising since the education and training for employees is provided by educational institutions that are always lagging behind industry technologically. Therefore, under normal circumstances, a certain degree of skill deficiency or obsolescence of skills can be expected by the time students graduate from university programs and enter into employment. Nevertheless, it is important to understand the nature of skill gaps and what causes them in order to develop sound employment, education, and training policies and practices (Shah & Burke, 2005).

Today's employers require employees to have soft or non-technical skills in addition to technical skills (Alpern, 1997; Clagett, 1997). While such skills may vary with industries; they include knowing how to learn, communication skills, creativity, problem solving, interpersonal skills, leadership, and ability to function as part of a team (McNabb 1997; Murnane and Levy, 1996; Oliver et al. 1997, as cited in Imel, 1999). In addition to information technology and information management skills, other soft skills managers consider essential in employees are: strategic planning and managing customers, and change management (Institute of Management, 1997). Therefore, with rapid technological changes, skill gaps in the workforce will always exist (Shah and Burke, 2005) and workers with technical skills only will not effectively function in today's industries. The real challenge according to Beebe (1996), is that "The digital world is here and now, and ... employers...who [want] to stay prosperous, must ride this information wave into the future on the skills of employees who can work the secrets of microchips, of computer software, of the Internet...and bring their creations into the marketplace (p.6).

Unfortunately, the technical skills change so fast such that schools cannot match the pace at which technological changes occur. The question educators and employers should address is how to 'shoot this moving target' - bridge the skills gap.

Addressing the skill gaps requires identifying the nature and extent of skill gaps and observing current practices by higher education and industry to design effective training systems. This paper reviews aspects of skill gaps, establishes the nature and extent of skill deficiencies among university graduates, and identifies initiatives by universities and industries to address the skill gaps problems. Specifically, the paper answers the following questions: 1) what is the magnitude of skill deficiencies among university graduates, i.e. in what industries are the skill gaps prevalent and to what extent; 2) what skills do employers find lacking in university graduates; and 3) what are the initiatives by industry and universities to address the skill gaps?

As indicated, technological developments throughout the world (Machin & Van Reenen, 1998) and reengineering efforts (Abraham, 2000) have created a crisis in skill gaps in the work force. While the problem of skill gaps is universal, it affects other countries more than others. Commenting on the skills gap crisis in the United States, Anonymous (1989) noted: "The United States is not educating and training its citizens to be productive and competent members of the work force. Consequently, its people are not qualified enough to meet the demands of the high-technology economy of today and tomorrow. Unless reform is undertaken, the outcome is obvious....U.S. industry will lose the global economic race." Sadly enough, the blame is put on educational systems, and yet no educational system can compete or drive industry. It is the other way round; education supports industry. This perhaps explains why US companies spend billions of dollars on training each year (Dubois and Rothwell, 2004), instead of spending the money on fixing or improving education systems. For instance, in 1998 the amount spent on corporate training was \$62.5 billion (Industry Report, 1999).

Nature of deficiencies and extent of skill gaps

Skill gaps do not always result from inadequate preparation of graduates in educational programs. And so, higher education graduates are not always lacking in skills required by industry. The opposite also exists where some higher education graduates are overqualified for certain industries. For instance, small businesses operations are not appropriate for graduate employment because they do not utilize graduate skills (Pittaway & Thedman, 2005). In other industries, university graduates may possess certain required skills and at the same time be deficient in other essential skills. Therefore, the nature and extent of skill gaps varies with industries. In a study to identify gaps between key skill and knowledge areas to one's current employment contrasted with perceptions of their own academic preparation in these areas,

marketing alumni perceived to be under-prepared in key skills and over-prepared in designated knowledge areas (Davis, Misra & Van Auken, 2002).

Several industrial sectors have reported skill gaps, but among those reporting high levels of skill gaps are: financial (Ahmed, 2003; Cook, 2005), information technology (Beebe, 1996; Goodwin, 2005; Shah & Burke, 2005), and manufacturing (Sabourin, 2001). In the financial services sector, too many employees are underperforming and there are not enough people with the required financial skills to sustain most organizations (Cook, 2005). Similarly, in a study on accounting education programs, the programs did not provide students with adequate skills to operate when employed (Ahmed, 2003). The study noted major gaps between technical skills that students learn in university accounting programs and what accountants practice in the real world. Other managers have pointed out major gaps in students' business and management courses: practical experience and real-world skills (Elkins, 2002).

The shortage of technical workforce is a common problem throughout the world, including the United States and Canada. For instance, more than 80 percent of manufacturers in the US cannot find enough qualified workers, e.g. high-skilled machinists, technicians, and engineers to meet customer demands (Hopkins, 2005). Similarly, Canada reports skill deficiencies in the manufacturing firms, especially mechanical engineers, electronic technicians, computer programmers, design managers, CAD technicians, computer professionals, production managers, machinists, and industrial engineers (Sabourin, 2001).

Tackling the skill gaps problem requires concerted efforts by both industry and education. As Shah and Burke (2005) point out, if employers rely on schools to bridge the gaps, then the adjustment process will be longer; due to the slow nature schools approve and implement new curricula. Therefore, to reduce the skills gaps, universities and industry need to come up with effective initiatives, such as internships or industrial experiences, school-to-industry partnerships, and other on-the-job training programs to provide the desired skills.

Industry and university initiatives to reduce skill gaps

A number of industries have partnered with other private sector companies, education, training organizations to develop initiatives to reduce the skills gaps in current and future employees, for example, British Airways' Heathrow Airport initiative (Thorp, 2004), and the Network of Excellence in Training (NExT) program (Abraham, 2000).

Other initiatives are in the form of software. Keys2Work is one such tool for career exploration and job matching. The tool bridges the gap between the skills required for work and the skills of job seekers (Brown, 2001). According to the developers, it helps established workers obtain proper career focus and identify skill developmental activities in the chosen career.

Similarly, the Prometric Testing program is another initiative by industry to close the skill gaps. The program provides individuals and employers the information and resources needed to achieve the best possible fit between skill levels, work preference and job requirements. For further information on the program, visit: http://www.pendragon-cs.com/global_consulting/prometrics.php. Such program support the workforce because individuals can use it to set better career goals, choose appropriate training as needed and gain credentials that confirm their knowledge and skills

To plug gaps in business-and softer skills, other companies have developed courses that cover technical and business skills, including effective communications, presentation skills, time management, consulting, conflict resolution and business aspects of the departments they serve (King, 1997). Even at government level, the need to reduce the skill gaps is evident. Former US president, Bill Clinton acknowledged the skills gap and his desire to narrow the gap by spending \$1 billion on job training and adult education (Bennet, 1999). It is not surprising that several billions of dollars are spent annually on training and that lately, a number of companies realize the importance of on-the-job training and establish and support training departments.

Universities, on the other hand, recognize the skill gaps and have similar programs to address the problem. For example, internship courses have been part of university programs to supply the missing pieces. Such courses give students an opportunity to apply in a real work environment skills acquired in the classroom. But, such courses are ineffective if the students are given trivial or meaningless tasks (Elkins, 2002). The courses must provide students with opportunities to apply their skills and means to identify skill gaps between their training and work responsibilities. Other initiatives by universities to close the skills gaps include partnerships between universities and industries, e.g. Tech Prep program. Tech-Prep programs are federally funded programs that provide students with workforce skills. The programs combine a minimum of two years of secondary education and a minimum of two years of postsecondary education. Tech Prep programs of study lead to an associate or a baccalaureate degree, or to a postsecondary certificate, in a specific career field. For examples of Tech-Prep programs, visit: <http://www.nd.gov/cte/statewide-inits/tech-prep.html>; http://www.aztechprep.org/Academic_Skills/academic_skills.html; or http://www.techprepohio.org/about/what_is_tech_prep.asp. Educational institutions also make use of Advisory Committees as sounding boards on curriculum direction, as well as field trips, and guest speakers to bring the outside world experience into the classroom.

Conclusion

Fighting the skill gaps problem in our workforce is not easy, requires multi-pronged approaches, and cannot be left to education alone. The problem requires efforts by all stakeholders: students, parents, universities and industries. Therefore, before coming up with strategies to deal with skill shortages, two approaches are recommended: 1) analyze the skills needed for existing jobs in the economy; and 2) ensure the supply of skills responds to skill demand. These approaches eliminate investing in the wrong training and development or producing large number of frustrated people with excellent skills but no jobs. Besides, it makes economic sense to channel resources into preventing the problem from happening in the first place (Prickett, 1998). It would be helpful if universities were quick to make adjustments to educational programs once skill gaps have been identified.

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